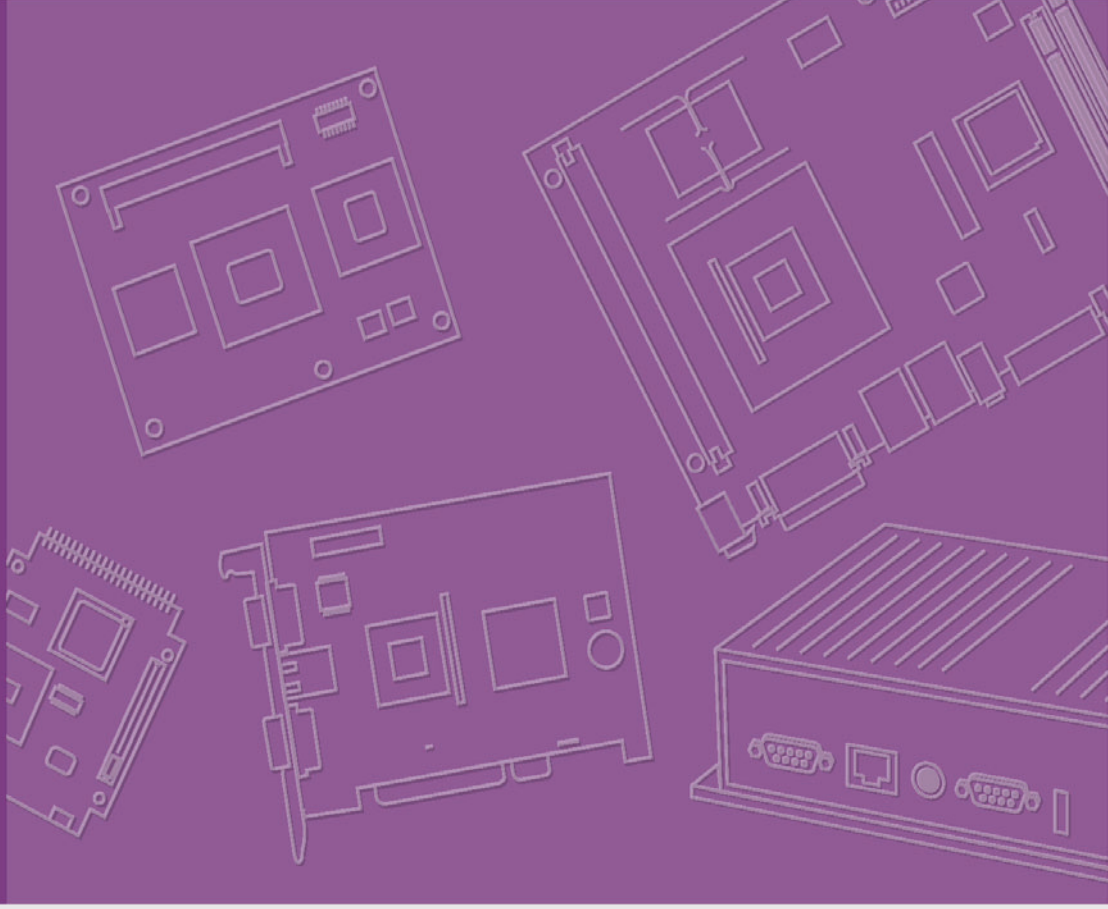

User Manual

ACP-7000 Series

7U Rackmount Industrial Computer Chassis with SCSI Ultra320 Mobile HDD Trays

Trusted ePlatform Services

ADVANTECH

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Acknowledgements

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Safety Instructions

1. Read these safety instructions carefully.
2. Keep this installation reference guide for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. Do not leave this equipment in an environment unconditioned where the storage temperature under 0 °C (32 °F) or above 40 °C (104 °F), it may damage the equipment.
8. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE Openings.
9. Place the power cord such a way that people can not step on it. Do not place anything over the power cord. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product.
10. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
13. Never pour any liquid into an opening. This could cause fire or electrical shock.
14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
15. If any of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the installation user manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.
16. **CAUTION:** The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacture. Discard used batteries according to the manufacturer's instructions.
17. THE COMPUTER IS PROVIDED WITH CD DRIVES THAT COMPLY WITH APPROPRIATE SAFETY STANDARDS INCLUDING IEC 60825.

    CLASS I LASER PRODUCT
    KLASS I LASER PRODUKT

18. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
    (1). this device may not cause harmful interference, and

(2). this device must accept any interference received, including interference that may cause undesired operation.

19. **CAUTION:** Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges.
20. **CAUTION:** Always ground yourself to remove any static charge before touching the motherboard, backplane, or add-on cards. Modern electronic devices are very sensitive to static electric discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.
21. **CAUTION:** Any unverified component could cause unexpected damage. To ensure the correct installation, please always use the components (ex. screws) provided in the accessory box.

A Message to the Customer

Advantech Customer Services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known. Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the best performance possible from your products. If you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

Please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and can be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice about application requirements or specific information on the installation and operation of any of our products.

Product Warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered, for example, type of PC, CPU speed, Advantech products used, other hardware and software used, etc. Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

When you open the carton, please make sure that the following items have been shipped:

- ACP-7000 Chassis
- User Manual
- Warranty Card
- Accessory box with a package of screws (for fastening the backplane, disk drives and the ear handles), a 68-pin SCSI flat cable, a pair of keys, 20 rubber cushions, a pair of ear handles, a big-to-small 4-pin power wire, a spare filter.

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ACP-7000 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the ACP-7000, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also, please notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

Chapter 1 General Information 1

1.1 Introduction 2
1.2 Specifications 2
1.3 Power Supply Options 3
Table 1.1: Power supply options 3
1.4 Environment Specifications 3
Table 1.2: Environment specifications 3
1.5 Dimension Diagram 4
Figure 1.1 Dimension diagram 4

Chapter 2 System Setup 5

2.1 Chassis Front and Rear Panel 6
2.1.1 The Front Panel 6
Figure 2.1 Front panel with door close 6
Figure 2.2 Front Panel with door open 6
2.1.2 The Rear Panel 7
Figure 2.3 Rear panel of backplane version 7
Figure 2.4 Rear panel of motherboard version 7
2.2 Removing the Chassis Covers 8
Figure 2.5 Removing the top chassis cover 8
2.3 Installing the Backplane 8
Figure 2.6 Installing the backplane 8
2.4 Installing CPU Card & Add-on Cards 9
Figure 2.7 Installing a full-length CPU card 9
2.5 Hold-down Clamp 10
Figure 2.8 Installing hold-down clamp 10
Figure 2.9 The circle hole should face the rear panel 10
2.6 Installing Disk Drives 11
Figure 2.10 Removing the disk drive bay 12
Figure 2.11 Installing disk drives 12
2.7 Attaching the Ears and Handles 12

Chapter 3 Operation 13

3.1 The Front Panel of ACP-7000 14
3.1.1 Switch, Buttons, and I/O Interfaces 14
Figure 3.1 Switch, buttons and front I/O interfaces 14
3.1.2 LED Indicators for System Status 15
Figure 3.2 Front LED panel 15
Table 3.1: LED Indicators for System Status 15
3.1.3 LED Indicators for Power Voltage Status 16
Table 3.2: LED Indicators for Power Voltage Status 16
3.2 Replacing the Cooling Fan 16
3.2.1 Replacing the Front Cooling Fan 16
Figure 3.3 Replacing the cooling fan 16
3.2.2 Replacing the Fan behind SCSI Backplane 17
Figure 3.4 Replacing the SCSI backplane fan 17
3.3 Replacing the Filters 18
3.3.1 Replacing the Front Door Filters 18
Figure 3.5 Replacing the front door filters 18
3.3.2 Replacing the Fan Filters 18
Figure 3.6 Replacing the fan filter 18

3.4 Replacing the Power Supply 19
Figure 3.7 Replacing the power supply module 19
Figure 3.8 Power cord plugs orientation on the socket 20

Chapter 4 Alarm Board 21

4.1 Alarm Board Layout 22
Figure 4.1 Alarm board layout 22
4.2 Alarm Board Specifications 22
4.2.1 Connector, Jumper and Pin Definition 23
Table 4.1: CN1: Auxiliary External Power Connector, Standard Mini 4-Pin Power Connector 23
Table 4.2: CN4: Temperature Sensor (LM75) Connector 23
Table 4.3: CN13: Voltage Detection Input Connector 23
Table 4.4: CN16: Power Good Input 23
Table 4.5: CN17: Alarm Reset Connector 23
Table 4.6: CN18: Output Connector to LED Board 23
Table 4.7: CN26: External HDD LED Connector 23
Table 4.8: FAN1~FAN7, Fan Connectors 23
Table 4.9: J1: External Buzzer 23
Table 4.10: SW1: Fan Number Select Switch 23
4.2.2 Switch Settings 24
Table 4.11: SW1, Fan Number Setting 24
4.3 Thermal Sensor 24
Figure 4.2 Thermal sensor module 24
Table 4.12: CN1 & CN2, Temperature Sensor Connector 25
Table 4.13: SW1, Thermal Sensor I.D. Number Setting 25

Chapter 5 SCSI Storage and RAID 27

5.1 6-slot SCSI SCA Backplane 28
5.1.1 SCSI Backplane Layout 28
Figure 5.1 Front side layout of the SCSI backplane 28
Figure 5.2 Back side layout of the SCSI backplane 28
5.1.2 Connectors and Jumpers 29
Table 5.1: Connectors and Jumpers 29
5.2 SCSI Disk Drive Housing 30
Figure 5.3 SCSI disk drive housing and wires 30
5.3 Wires & Cables of the SCSI Storage 30
5.4 Installing SCSI Disk Drives 31
5.4.1 Installing the SCSI Disk Drives 31
Figure 5.4 Pushing up the latch 31
Figure 5.5 Removing the mobile tray 31
Figure 5.6 Installing a SCSI SCA-2 80-pin HDD 32
5.4.2 Installing GEM318 Driver 32
5.5 SAF-TE 33
5.6 RAID Application 34
Table 5.2: SCSI HDD Power and Activity Status LEDs 34
Figure 5.7 Length for RAID card or controller 34

Appendix A Exploded Diagram and Parts List 35

A.1 Exploded Diagrams 36
Figure A.1 Exploded Diagram 1 36
Figure A.2 Exploded Diagram 2 36
Figure A.3 Exploded Diagram 3 37

Appendix B Backplane & Motherboard Options .39

B.1 Backplane Options 40
Table B.1: PICMG 1.3 Backplane Options 40
Table B.2: PICMG 1.0 Backplane Options 40
B.2 Motherboard Options 41
Table B.3: Motherboard Options 41

Chapter 1

General Information

This chapter provides general information about the ACP-7000.

Sections include:

- Introduction
- Specifications
- Power supply options
- Environment specifications
- Dimension diagram

1.1 Introduction

ACP-7000 is a 7U-high rackmount industrial computer chassis for high-performance and high-capacity computing platforms. It meets a variety of application needs for filing, printing, e-mails and web serving. This powerful computing server includes full disk array storage for minimizing the system downtime, especially in mission-critical computer telephony applications, industrial automation, and factory management. A wide range of standard computing peripherals can be integrated with the chassis to meet different application needs for operation under harsh conditions 24 hours a day, 7 days a week.

1.2 Specifications

- **Construction:** Heavy-duty steel
- **Disk Drive Capacity:** One slim-type optical disk drive bay, two 5.25” disk drive bays, and one 3.5" disk drive bay
- **RAID Storage:** Supports six 3.5" SCSI SCA 80-pin hot-swappable HDDs. Each mobile tray has a latch for protection and a pair of LEDs for displaying the HDD power and HDD activity status.
- **Security Protection:** The RAID storage system, power switch and system reset buttons are all behind the lockable door.
- **LED Indicators on Front Panel:** Bi-color LEDs (green/red) for Power, Temperature, and Fan status; single-color LEDs (green) for HDD activity and Power Singles Status (+3.3 V, +5 V, +12 V, -5 V and -12 V). For the SCSI storage, each mobile tray has a single-color LED (green) that displays HDD power and a bi-color LED (blue/red) that displays HDD status.
- **Switch and Buttons on Front Panel:** Power switch, Alarm Reset button and up to two System Reset buttons.
- **Front I/O Interfaces:** Dual USB and one PS/2 keyboard connector
- **Cooling System:** Four 92 mm x 92 mm (57 CFM) hot-swappable cooling fans and two 80 mm x 80 mm (47 CFM) cooling fans behind the SCSI backplane.
- **Air Filters:** Four filters (92 mm x 104 mm) inside of the fan modules, one filter (174 mm x 79 mm) behind the front door, and two filters (98 mm x 37 mm) on both sides of the LED panel.
- **Slide Rails:** General Device C-300 series supported
- **Weight:** 35 kg (77 lbs)
- **Dimensions (W x H x D):** 482 x 307 x 500 mm (19" x 12.1" x 19.7")
- **Chassis Color:** Black

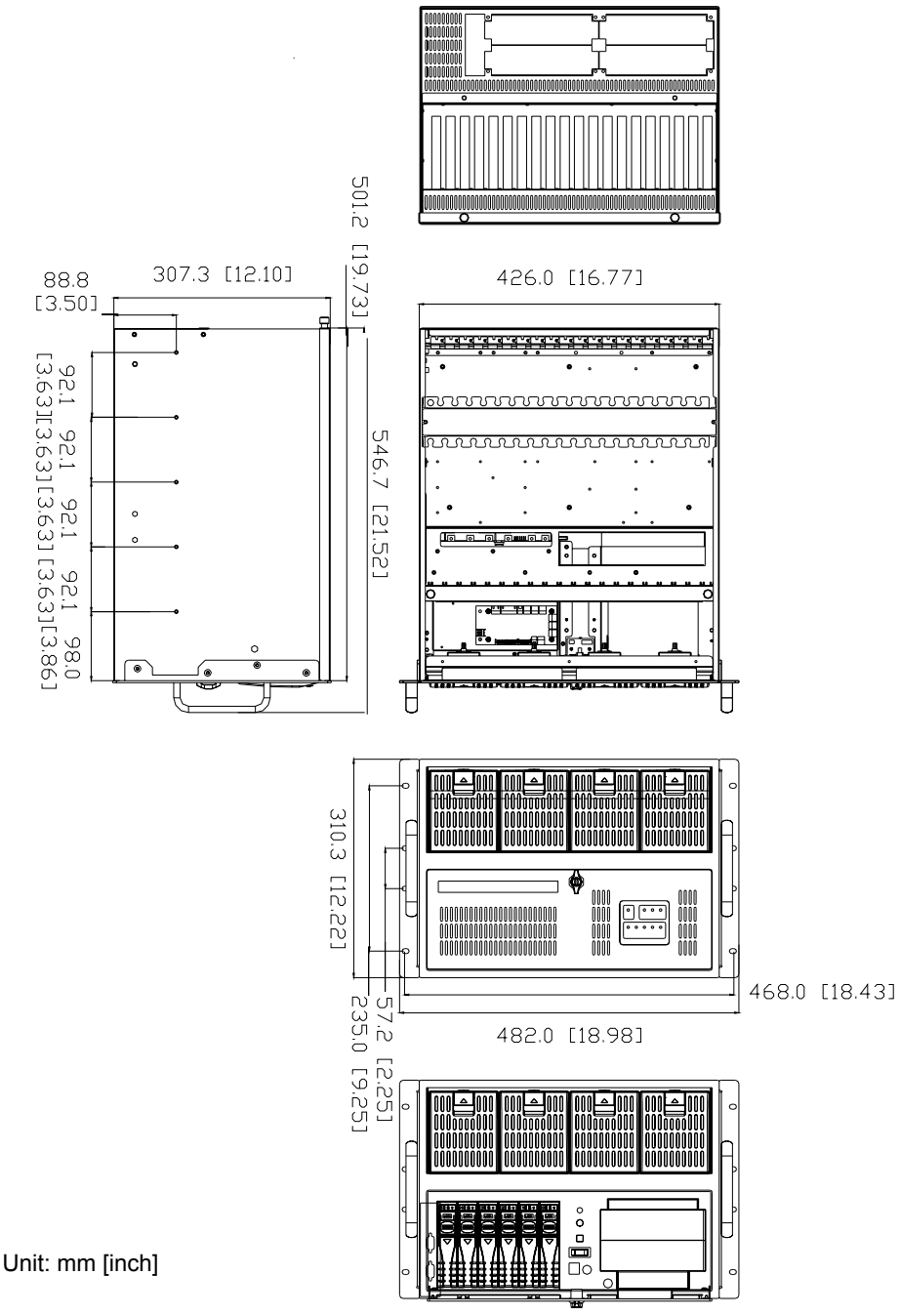
1.3 Power Supply Options

Table 1.1: Power supply options			
Model Name	1757001757	17570017578	1757001759
Watts	460 W (ATX, PFC) (1+1 redundant)	570 W (ATX, PFC) (2+1 redundant)	810 W (ATX, PFC) (3+1 redundant)
Input rating	100 ~ 240 Vac (Full range)	115 ~ 230 Vac (Full range)	115 ~ 230 Vac (Full range)
Output voltage	+5 V @ 42 A, +3.3 V @ 30 A, +12 V @ 32 A, -5 V @ 0.8 A, -12 V @ 1 A, +5 V_{SB} @ 2A	+5 V @ 50 A, +3.3 V @ 40 A, +12 V @ 34 A, -5 V @ 1 A, -12 V @ 1 A, +5 V_{SB} @ 1.2 A	+5 V @ 75 A, +3.3 V @ 60 A, +12 V @ 51 A, -5 V @ 1.5 A, -12 V @ 1.5 A, +5 V_{SB} @ 1.6 A
Minimum load	+5 V @ 2 A, +3.3 V @ 0.2 A, +12 V @ 0.5 A +5V_{SB} @ 0.1 A	+5 V @ 6 A, +3.3 V @ 2 A, +12 V @ 3 A, -12 V @ 0.1 A, -5 V @ 0.1 A, +5 V_{SB} @ 0.1 A	+5 V @ 9 A, +3.3 V @ 3 A, +12 V @ 4.5 A, -12 V @ 0.15 A, -5 V @ 0.15 A, +5 V_{SB} @ 0.15 A
MTBF	100,000 hours @ 25° C	100,000 hours @ 25°C	100,000 hours @ 25°C
Safety	UL/TUV/CB/CCC	UL/TUV/CB/CCC	UL/TUV/CB/CCC

1.4 Environment Specifications

Table 1.2: Environment specifications		
Environment	Operating	Non-operating
Temperature	0 to 40°C (32 to 104°F)	-20 to 60°C (-4 to 140°F)
Humidity	10 to 85% @ 40°C, non-condensing	10 to 95% @ 40°C, non-condensing
Vibration	1G rms	2 G
Shock	10G with 11 ms duration, half sine wave	30 G
Safety	CE compliant	

1.5 Dimension Diagram



Unit: mm [inch]

Figure 1.1 Dimension diagram

Chapter 2

System Setup

This chapter introduces the installation process.

Sections include:

- Installing the backplane
- Installing the CPU card or add-on card
- Installing disk drives
- Attaching the ears and handles

The following procedures instruct users on how to install the backplane, add-on cards, and disk drives into the ACP-7000 chassis. Please refer to Appendix A, Exploded Diagram, for all the detailed part names of ACP-7000.

Note! *Use caution when installing or operating the components with the chassis open. Be sure to turn off the power, unplug the power cord and ground yourself by touching the metal chassis before you handle any components inside the machine.*

2.1 Chassis Front and Rear Panel

2.1.1 The Front Panel

1. A SCSI disk drive housing with six mobile HDD trays is located on the front left. For IDE devices, there is one slim-type optical disk drive bay, two 5.25” disk drive bays, and one 3.5” disk drive bay on the right side.
2. Four easily maintained and hot-swappable fan units are located on the upper front.
3. Front door with LED panel and user-friendly rotary lock. Users can close the door with or without the key.
4. A pair of ear handles which users can simply fasten to the front-right and left edges of the chassis with the six screws provided.
5. Filters are located behind the front door and integrated with the fan units.

Figure 2.1 Front panel with door close

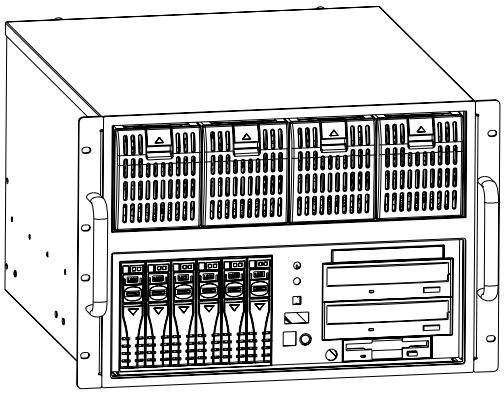


Figure 2.2 Front Panel with door open

2.1.2 The Rear Panel

There are two reserved 9-pin D-SUB openings and dual AC inlets on the rear panel. For the B/P version, it includes the B/P rear plate with 20-slot I/O brackets (Figure 2.3). For the M/B version, it includes the M/B rear plate with 7-slot I/O brackets and a ATX M/B I/O cover (Figure 2.4).

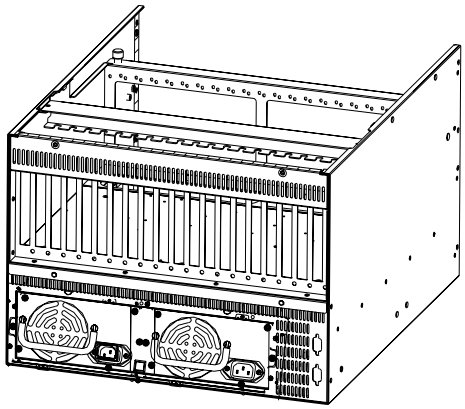


Figure 2.3 Rear panel of backplane version

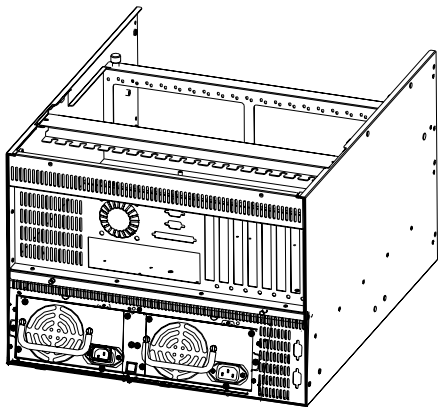


Figure 2.4 Rear panel of motherboard version

2.2 Removing the Chassis Covers

Please refer to Figure 2.5 and proceed as follows.

1. Detach the two thumb screws on the upper edge of the rear panel.
2. Remove the top cover.

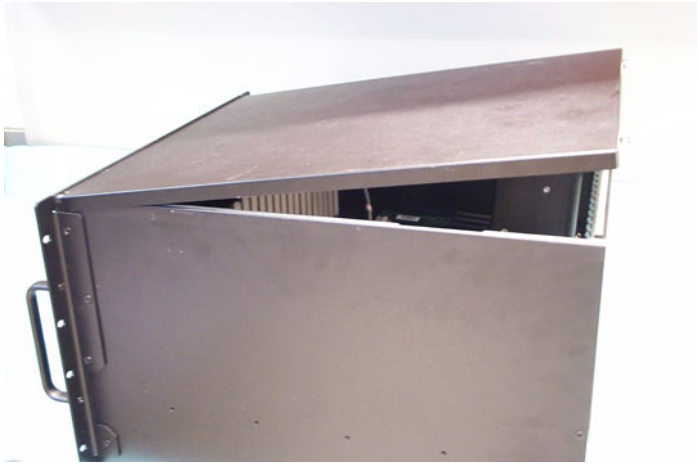


Figure 2.5 Removing the top chassis cover

2.3 Installing the Backplane

ACP-7000 supports backplanes with up to 20 slots. To install the backplane, please refer to Figure 2.6 and proceed as follows:

1. Remove the top chassis cover, and then dismantle the hold-down clamp by removing the four screws.
2. Put the backplane in the proper location and attach the supplied EMI spring shielding with the screws provided. Then fasten it onto the chassis.
3. For the PICMG 1.0 BACKPLANE, connect the orange-white wire from connector “HCN1” on the backplane to connector “CN21” on the CPU card.
4. Connect the 20-pin ATX power connector from the power supply to the backplane. (For the PICMG 1.0 BACKPLANE, the 4-pin +12 V power connector is connected to the CPU card.)
5. Replace the hold-down clamp and fasten it to the chassis.
6. Return the top chassis cover and fasten it.

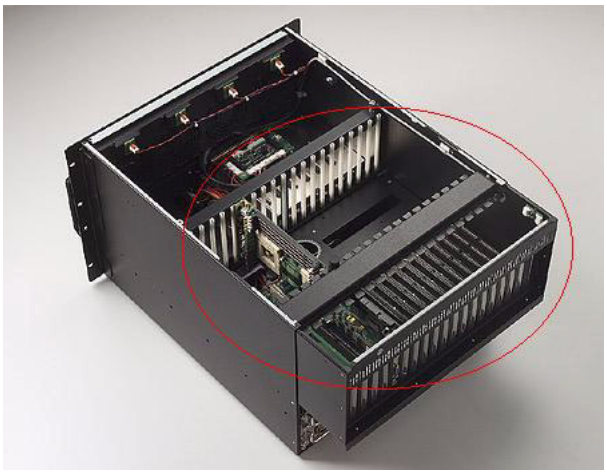


Figure 2.6 Installing the backplane

2.4 Installing CPU Card & Add-on Cards

ACP-7000 supports up to 20 add-on cards. To install a CPU card or add-on card, please proceed as follows:

1. Select a vacant PICMG slot for a full-length CPU card, or a PCI/ISA slot for other add-on cards. Then remove the corresponding I/O bracket attached to the rear plate of the chassis.
2. Insert the CPU card (with CPU, CPU cooler, RAM, and necessary cables installed), or add-on card vertically into the proper slot (See Figure 2.7). For full-length cards, please make sure that the card bracket has been inserted properly and the other edge of the card has been inserted into the plastic guiding fillister. Fasten the card with the screw on top of the I/O bracket.
3. Connect the +5Vsb and PS_ON wires from the power supply to the CPU card.
4. Connect the 9-pin USB wire, power switch wire and system reset switch wire from the chassis to the CPU card.
5. For the PICMG1.0 Backplane, connect the orange-white wire from the connector “CN20” on the CPU card to the connector “HCN1” on the backplane. Connect the 4-pin +12 V power connector from the power supply to the CPU card.
6. Repeat Steps 2 and 4 if there is more than one CPU card or add-on card.
7. There are two rows of notches on both sides of the hold-down clamp for inserting rubber cushions into. One side is for PCI cards, while the other side is for ISA cards. Depending on the card height, the cushions can be inserted upward or downward. After the rubber cushions have been inserted into the notches, they will stabilize the add-on cards to protect them from shock and vibration.
8. Replace the hold-down clamp and screw it in place.

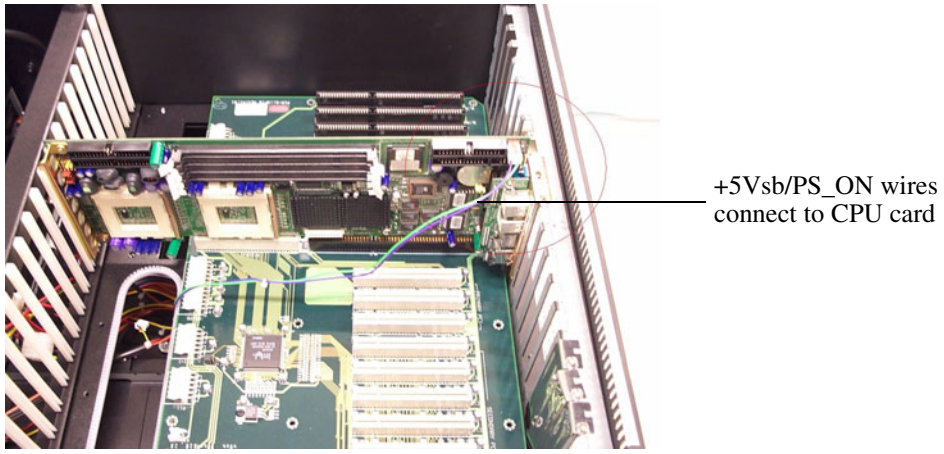


Figure 2.7 Installing a full-length CPU card

2.5 Hold-down Clamp

The hold-down clamp protects all the cards from vibration and shock. After installing all the cards, re-fasten the hold-down clamp. Please refer to the following steps.

1. After plugging in the CPU card and add-on cards, please insert the rubber cushions provided into the notches of the hold-down clamp, and adjust them to the placement of the cards. The cushions offer these cards protection against shock and vibration.
2. Put the hold-down clamp back into its original position. Please note that the circle hole on the hold-down clamp should face toward the rear panel. (See Figure 2.9).
3. Secure the hold-down clamp to the chassis with the four screws.

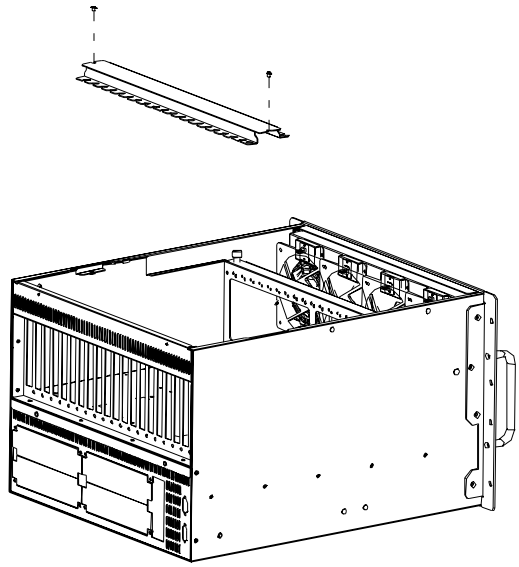


Figure 2.8 Installing hold-down clamp

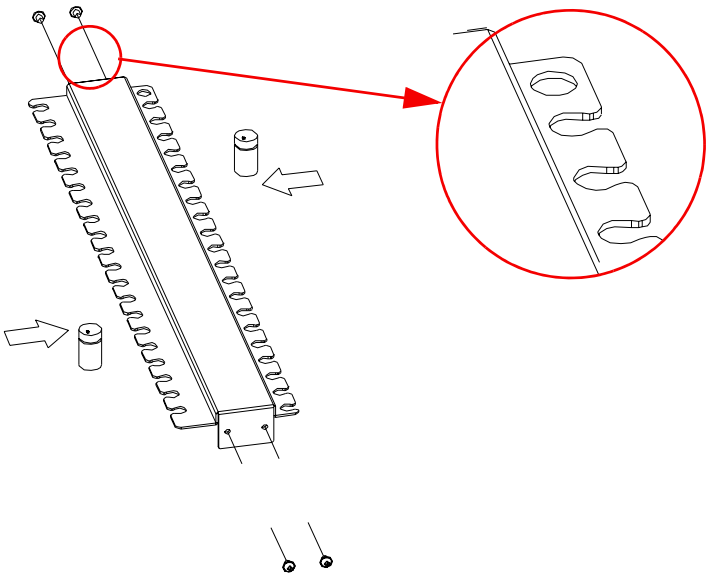


Figure 2.9 The circle hole should face the rear panel

2.6 Installing Disk Drives

The ACP-7000 supports both IDE and SCSI storage devices. We introduce the IDE disk drive installation procedure here. For installing a SCSI HDD, please refer to Chapter 5 for detailed SCSI information and installation procedure.

The IDE disk drive housing supports one slim type optical disk drive, two 5.25” and one 3.5” disk drive devices. Please follow these steps for installation.

1. Release two thumbscrews to draw out the backplane holder until there is enough space to take out the disk drive housing (See Figure 2.6).
2. Undo the four screws of the cushions and lift up the IDE disk drive housing (See Figure 2.9).
3. To install the slim type optical disk drive, just simply fix it to the housing with the four screws provided. And plug the small convert board attached with the two screws provided.
4. Insert other disk drives into the proper location in the disk drive housing and secure them with the screws provided (See Figure 2.10).
5. Connect the suitable cables from the CPU card to the 3.5” HDD, FDD or the optical disk drive. Then plug the 4-pin power connector into each disk drive.
6. Put the disk drive housing back in the correct position and fasten it with the screws.
7. Return the backplane holder and fasten it with the two thumb screws.

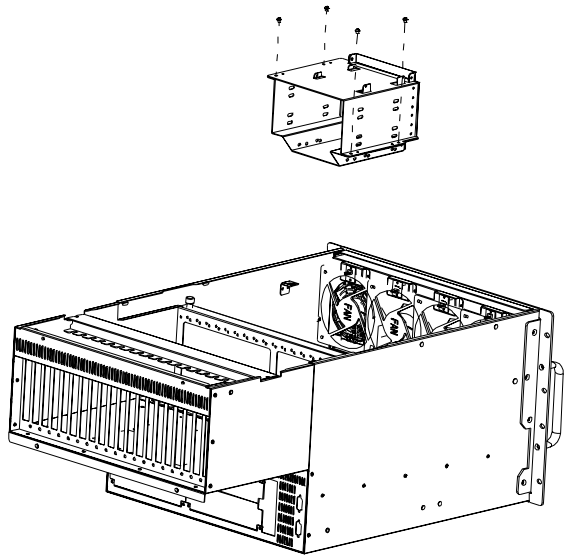


Figure 2.10 Removing the disk drive bay

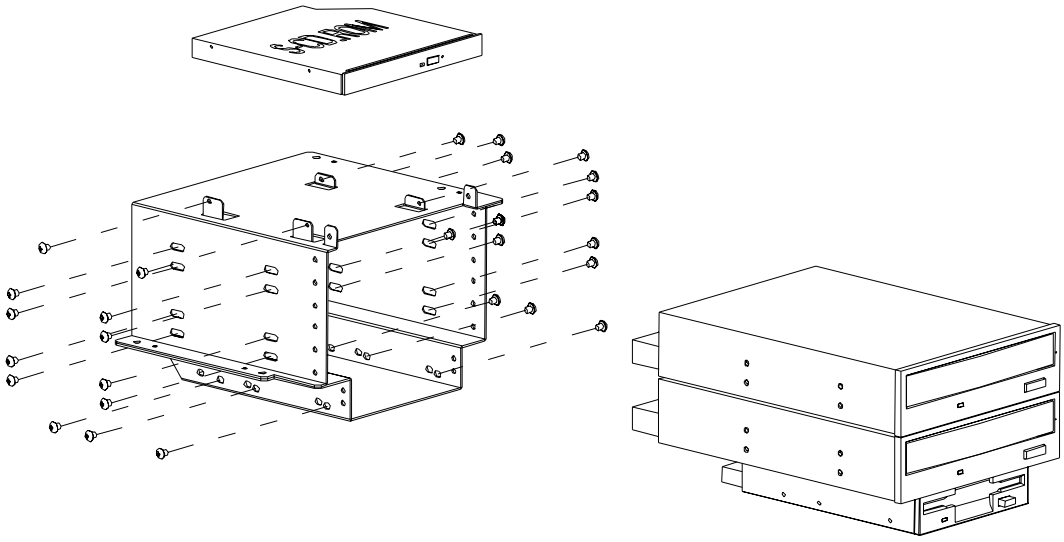


Figure 2.11 Installing disk drives

2.7 Attaching the Ears and Handles

There is a pair of ears and handles in the accessory box. If you need to install the chassis on a rack, please simply fasten them to the front-right and front-left edges with the screws provided.

Chapter 3

Operation

This chapter introduces the system operation information.

Sections include:

- The front panel
- Replacing the cooling fans
- Replacing the filters
- Replacing the power supply

3.1 The Front Panel of ACP-7000

On the front panel, there is one Power switch, two System Reset buttons, one Alarm Reset button, a dual USB port, and a PS/2 connector. There are nine LED indicators on the lockable front door. Their individual functions are described below.

3.1.1 Switch, Buttons, and I/O Interfaces

Momentary Power switch: Press this button to turn the system power on or off. Please use system shutdown or press this switch for few seconds to turn off the system ATX power.

Alarm Reset button: Whenever a fault occurs in the system (e.g., fan failure or the temperature in the chassis is too high), the audible alarm will be activated. Pressing this button will stop the alarm from beeping.

System Reset button: Press the button to reboot the system (up to two systems).

Dual USB port: Connect USB devices to the system with this port.

PS/2 connector: Connect a PS/2 keyboard to this connector

.

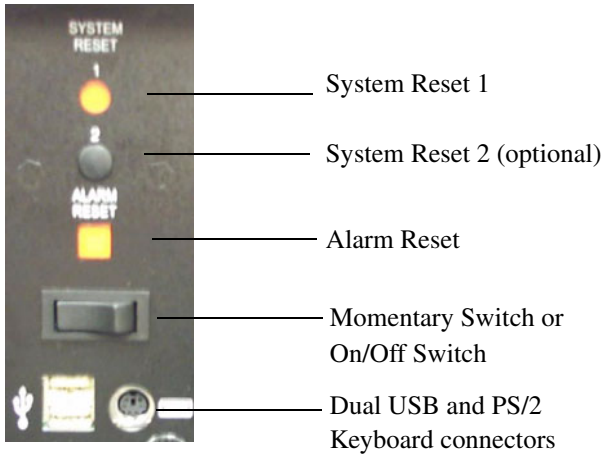


Figure 3.1 Switch, buttons and front I/O interfaces

3.1.2 LED Indicators for System Status

The LED display on the front door shows a series of indicators that are grouped into two categories for System Status and Power Voltage Status.

Figure 3.2 Front LED panel

The following table describes the LED indicators for System Status.

Table 3.1: LED Indicators for System Status

LED	Description	Green	Red
PWR	System power	Normal	Abnormal
HDD	Hard disk drive activity	Data access	No light
TEMP	Temperature in the chassis	Normal	Abnormal
FAN	Cooling fan status	Normal	Abnormal

When the system power is on, the **PWR LED** is always **Green**. When the **PWR LED** is **RED**, it indicates a redundant power supply module failure. To stop the alarm beep, press the **Alarm Reset** button. Examine the redundant power supply module right away and replace the failed module with a good one.

When the **FAN LED** is **RED**, it indicates a failed cooling fan, and the alarm is also activated. To stop the alarm beep, press the **Alarm Reset** button and then replace the failed fan with a good one immediately.

If the **TEMP LED** is **RED**, it means that the inside of the chassis has overheated. An audible alarm will be activated. To stop the alarm beep, press the **Alarm Reset** button. Inspect the fan filter and the rear section of the chassis immediately. Make sure the airflow inside the chassis is smooth and not blocked by dust or other particles.

3.1.3 LED Indicators for Power Voltage Status

The following table is of the individual LEDs which indicate the status of the back-plane voltage signals.

Table 3.2: LED Indicators for Power Voltage Status

LED	Description	LED on	LED off
+3.3 V	+3.3V signal	Normal	Abnormal
+5 V	+5V signal	Normal	Abnormal
+12 V	+12V signal	Normal	Abnormal
-5 V	-5V signal	Normal	Abnormal
-12 V	-12V signal	Normal	Abnormal

When an LED fails to light up, it means there is a problem with one of the voltage signals. Please check if the power supply connector is properly attached to the back-plane. If the problem persists, consult with an experienced technician.

3.2 Replacing the Cooling Fan

There are four cooling fans with filters located on the front top of the chassis. Each cooling fan is hot-swappable and very easy to maintain. There are two cooling fans located behind the SCSI backplane which are mentioned in Chapter 2.1.1. The fans provide the system with ample cooling by blowing air towards the rear. Once any of the fans fail, the alarm will beep. To stop the alarm, simply press the **Alarm Reset** button on the front panel and replace the failure fan right away. Please proceed according to the instructions below.

3.2.1 Replacing the Front Cooling Fan

1. Push down the latch on the fan unit located on upper front to unlock it.
2. Replace the cooling fan with a new one.
3. Fix the new cooling fan unit in place.
4. Move up the latch to lock the fan unit.

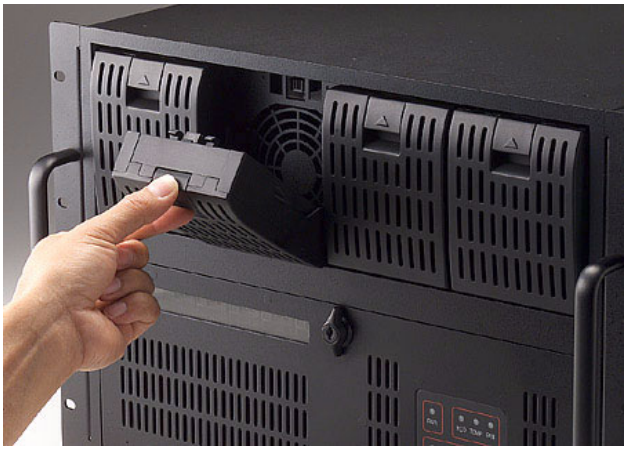
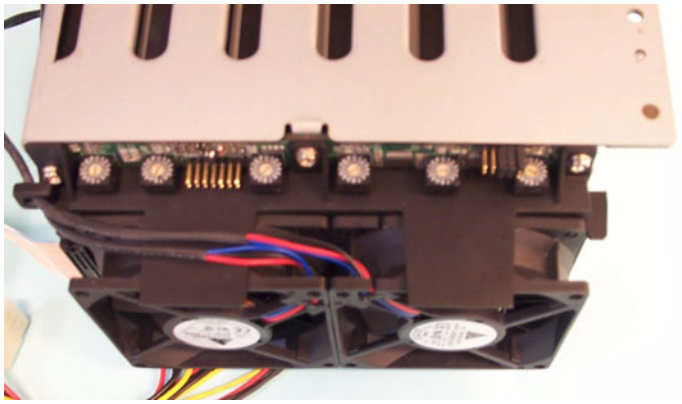


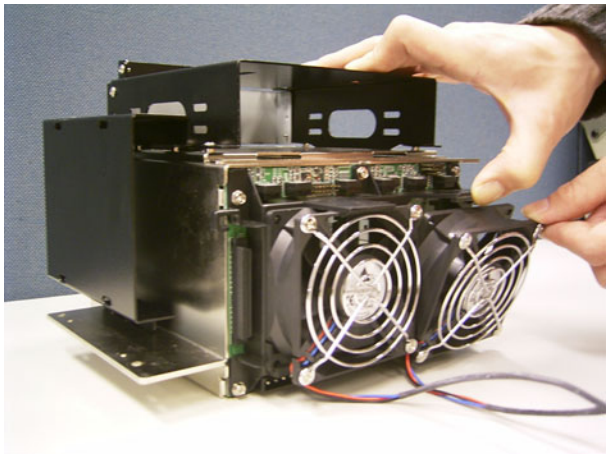
Figure 3.3 Replacing the cooling fan

3.2.2 Replacing the Fan behind SCSI Backplane

1. Remove the top front chassis cover.
2. Remove the backplane bracket and pull it out so that there is enough room for your hand to reach the fan behind the SCSI backplane.
3. Depress the tab on top of the fan unit so that the fan detaches from the fan enclosure. *Figure 3.4 b* is another view to show users how to remove the fan. By this way, you need to remove the whole SCSI disk drive housing first. It is not necessary to take out the SCSI housing to replace the fan.
4. Unplug the fan wire on the alarm board.
5. Put a new fan into the fan enclosure carefully until it is locked by the tab. Be sure to install it securely in the enclosure.
6. Plug the fan wire into the alarm board.
7. Return the backplane bracket to its original location and fasten it.
8. Replace the top chassis cover and then fasten it.



(a) Depress the tab on top of the fan unit



(b) Another way to replace the fan

Figure 3.4 Replacing the SCSI backplane fan

3.3 Replacing the Filters

The filter blocks dust and particles from the work environment and extends the longevity of the system. The filter should be replaced periodically. There are three filters behind the front door and four filters integrated with the front fan units. To replace the filter, please proceed as follows.

3.3.1 Replacing the Front Door Filters

1. Open the front door.
2. Loosen the screws located on the filter cover.
3. Replace the filter with a new one.
4. Fasten the filter cover.

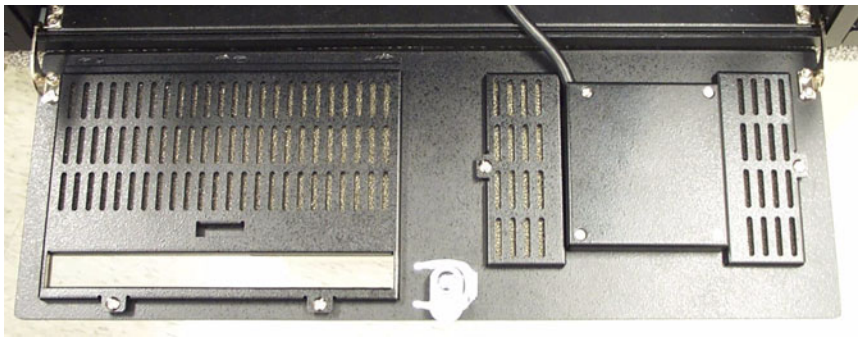


Figure 3.5 Replacing the front door filters

3.3.2 Replacing the Fan Filters

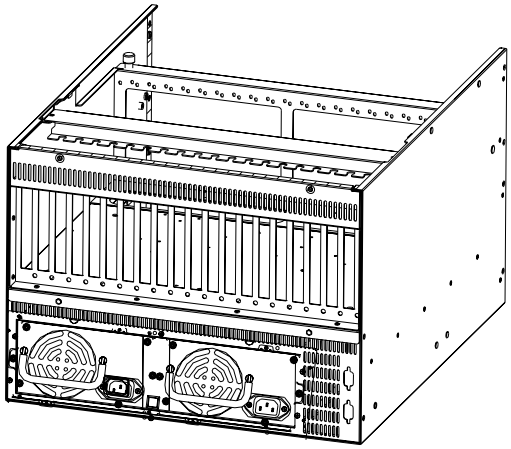
1. Push down the latch on the fan unit on the upper front to unlock it.
2. Open the filter bracket and simply take out the filter.
3. Replace the filter with a new one and then replace the fan bracket.
4. Return the fan unit to its original place and then lock it by push up the latch

Figure 3.6 Replacing the fan filter

3.4 Replacing the Power Supply

The ACP-7000 supports various power supply models. To replace the power supply module, please proceed as follows:

1. Turn off the failed power supply module.
2. Loosen the screw on the failed module and then gently pull the module out by the handle (see *Figure 3.7-a and Figure 3.7-b*).
3. Make sure that the new power supply module is the same rating as the currently installed one.
4. Slide the power supply module inward until it locks into position, then tighten the screws.
5. Return the handle to its original place.



(a) power supply module of 460 W

(b) power supply module of 570 W / 810 W

Figure 3.7 Replacing the power supply module

Note! *When you plug the two power cords into the sockets (for 570W and 810W models), please give them the same orientation (See Figure 3.8).*

Figure 3.8 Power cord plugs orientation on the socket

Chapter 4

Alarm Board

This chapter introduces the alarm board and thermal sensor specifications.

Sections include:

- Alarm board layout
- Alarm board specifications
- Thermal sensor
- Sensor I.D. number setting

The alarm board is located on the right side near the rear section. The alarm board makes an audible alarm when:

1. Any power supply module or redundant power supply fails
2. One of the system cooling fans or blowers fails
3. Internal temperature of the chassis reaches 50°C (default setting)

To stop the alarm beep, simply press the **Alarm Reset** button on the front panel and then take the necessary action to fix it.

4.1 Alarm Board Layout

The layout and detailed specification of the alarm board are given below:

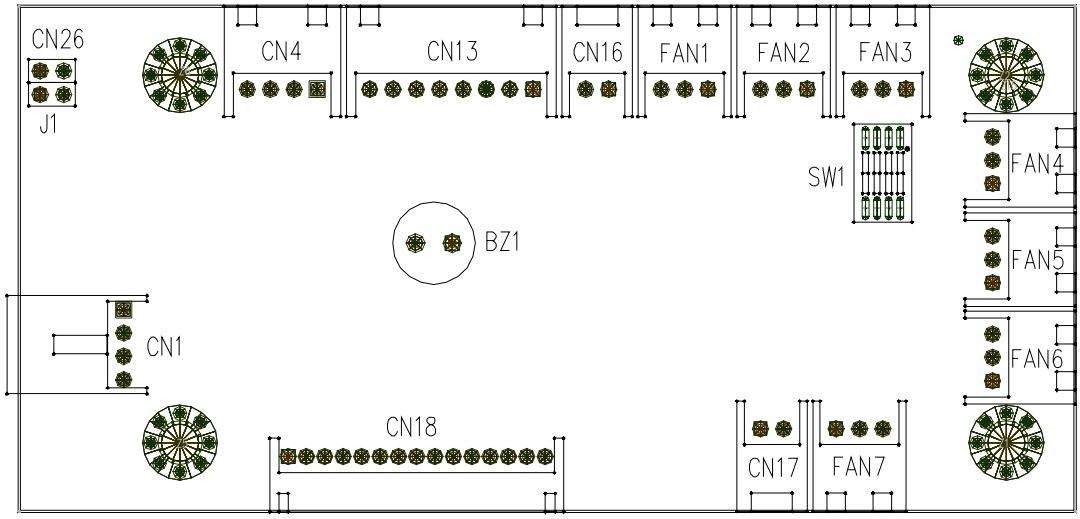


Figure 4.1 Alarm board layout

4.2 Alarm Board Specifications

Input Power: +5 V, +12 V

Input Signals:

- 7 FAN connectors
- One thermal board connector (support up to 8 thermal sensors in series)
- One power good input
- One alarm reset input
- One voltage signal connector (connect from backplane, includes ±12 V, ±5 V, +3.3 V)
- One Hard Disk LED connector (connect from CPU card)

Output Signals:

- One LED board connector
- One Buzzer output

4.2.1 Connector, Jumper and Pin Definition

Table 4.1: CN1: Auxiliary External Power Connector, Standard Mini 4-Pin Power Connector			
Pin 1	+12 V	Pin 3	GND
Pin 2	GND	Pin 4	+5 V

Table 4.2: CN4: Temperature Sensor (LM75) Connector			
Pin 1	+5 V	Pin 3	T_SDAT
Pin 2	T_SCLK	Pin 4	GND

Table 4.3: CN13: Voltage Detection Input Connector			
Pin 1	+5 V_{SB}	Pin 5	+5 V
Pin 2	GND	Pin 6	+3.3 V
Pin 3	GND	Pin 7	-12
Pin 4	-5 V	Pin 8	+12 V

Table 4.4: CN16: Power Good Input			
Pin 1	Power Good A	Pin 2	GND

Table 4.5: CN17: Alarm Reset Connector			
Pin 1	ALARM RESET	Pin 2	GND

Table 4.6: CN18: Output Connector to LED Board			
Pin 1	GND	Pin 9	Temperature Good LED
Pin 2	Power Good +5 V	Pin 10	Temperature Fail LED
Pin 3	Power Good +12 V	Pin 11	FAN Good LED
Pin 4	Power Good -5 V	Pin 12	FAN Fail LED
Pin 5	Power Good -12 V	Pin 13	N/A
Pin 6	HDD_1	Pin 14	Power Good +3.3 V
Pin 7	Power Good LED	Pin 15	Power Good +5 V_{SB}
Pin 8	Power Fail LED		

Table 4.7: CN26: External HDD LED Connector			
Pin 1	HLED_ACT	Pin 2	N/A

Table 4.8: FAN1~FAN7, Fan Connectors			
Pin 1	GND	Pin 3	FAN_DEC
Pin 2	+12 V		

Table 4.9: J1: External Buzzer			
Pin 1	Buzzer	Pin 2	+5 V

Table 4.10: SW1: Fan Number Select Switch			
Pin 1	GND	Pin 5	GND
Pin 2	FAN_SEL1	Pin 6	FAN_SEL3

Pin 3	GND	Pin 7	GND
Pin 4	FAN_SEL2	Pin 8	RESET

4.2.2 Switch Settings

The alarm board is designed to connect with up to 7 fans. User can set the fan number by adjusting the switch, SW1, on the alarm board.

Table 4.11: SW1, Fan Number Setting

FAN NUMBER	SW 1-1	SW 1- 2	SW 1- 3	SW 1- 4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6 (default)	OFF	ON	ON	OFF
7	ON	ON	ON	OFF

4.3 Thermal Sensor

There is a thermal sensor located on the rear plate of the chassis. It is attached to the upper left corner of the chassis back plate. Please refer to Figure 4.2 for a diagram of the thermal sensor module layout.

The default sensor I.D. number is 1. Users can refer to Table 4.4 to set the sensor I.D. number by adjusting the switch, SW1 on the sensor module.

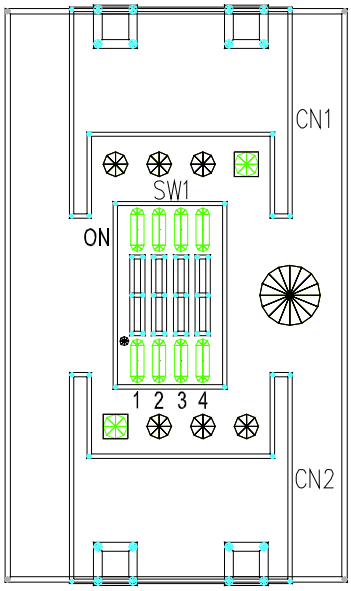


Figure 4.2 Thermal sensor module

Table 4.12: CN1 & CN2, Temperature Sensor Connector

CN1: Temperature Sensor Connector			
Pin 1	+5 V	Pin 3	T_SDAT
Pin 2	T_SCLK	Pin 4	GND

Table 4.13: SW1, Thermal Sensor I.D. Number Setting

Sensor I.D. No.	SW 1 -1	SW 1 - 2	SW 1 - 3	SW 1 - 4
1 (default)	OFF	OFF	OFF	ON
2	OFF	OFF	ON	ON
3	OFF	ON	OFF	ON
4	OFF	ON	ON	ON
5	ON	OFF	OFF	ON
6	ON	OFF	ON	ON
7	ON	ON	OFF	ON
8	ON	ON	ON	ON

Chapter 5

SCSI Storage and RAID

This chapter introduces the SCSI storage structures.

Sections include:

- 6-slot SCSI SCA backplane
- SCSI disk drive housing
- Installing SCSI disk drives

There is a SCSI SCA backplane fixed behind the SCSI disk drive housing. This backplane provides six 80-pin SCSI connectors, so users can install up to six 80-pin SCSI HDDs. Please see the relevant details below.

5.1 6-slot SCSI SCA Backplane

5.1.1 SCSI Backplane Layout

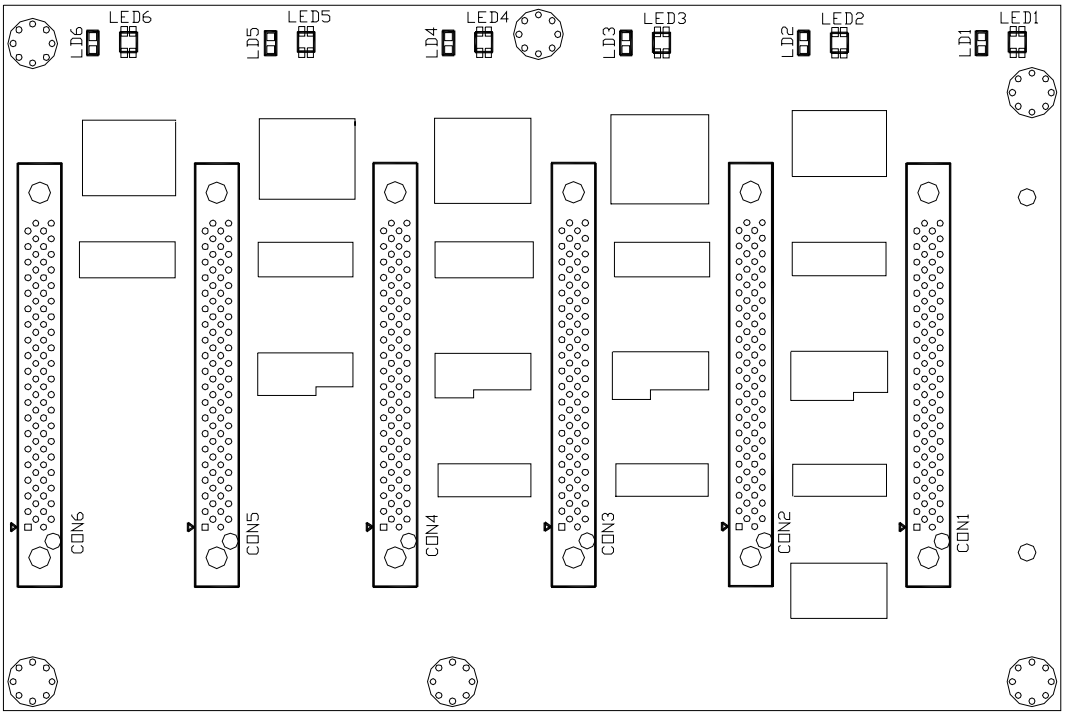


Figure 5.1 Front side layout of the SCSI backplane

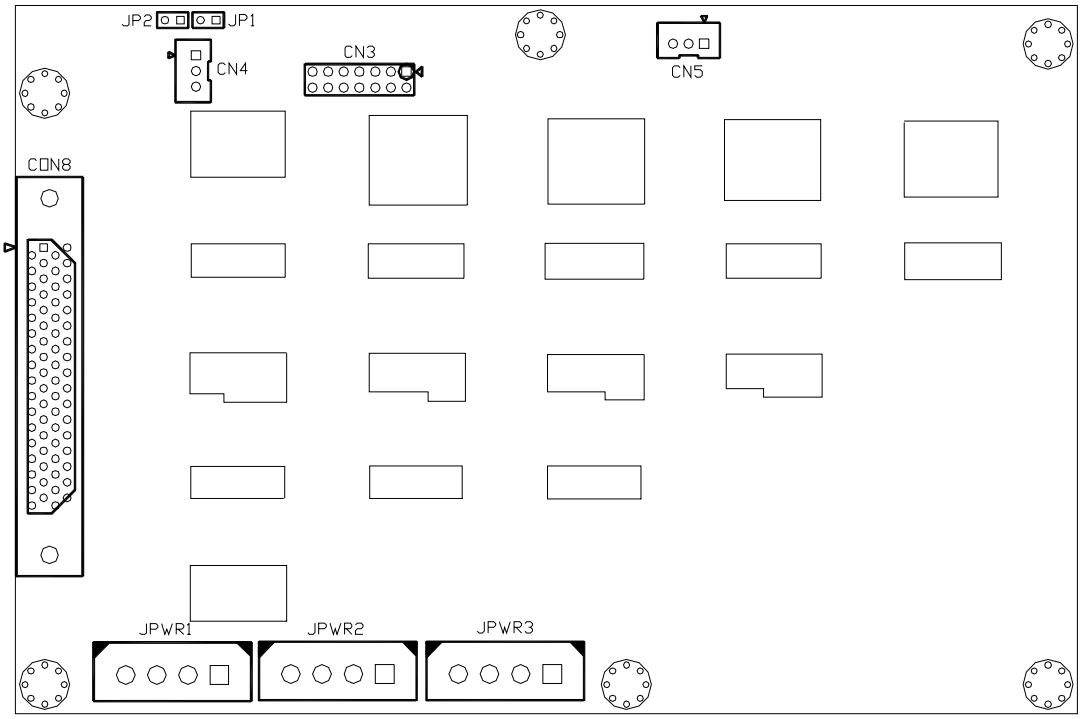


Figure 5.2 Back side layout of the SCSI backplane

5.1.2 Connectors and Jumpers

Table 5.1: Connectors and Jumpers	
CON1 ~ CON6	80-pin Ultra320 SCSI connector
CON8	68-pin Ultra320 SCSI connector
JPWR1 ~ JPWR3 JPWR3	4 Pin Power Connector
CN3	For SCSI HDD status alarm function: Pin 1, 3, 5, 7, 9, 11 are the status signals for HDD1 ~ HDD6; Pin 2, 4, 6, 8, 10, 12 are the alarm signals for HDD1 ~ HDD6;
CN4 ~ CN5	Fan Connectors

LD1 ~ LD6	SCSI HDD0 ~ HDD5 power LED (green)
LED1 ~ LED6	SCSI HDD0 ~ HDD5 Bi-Color LED (blue/red) HDD Activity (Blue) HDD Fault (Red) Rebuild (Blink pink) No error: Off Blink (1/sec) Identify: Fast blink (~3/sec)

HDD spin up options	JP1	JP2
Spin up when power is applied	Open	Open
Spin up after delay	Open	Close
Spin up on command mode	Close	Open
Reserved	Close	Close

5.2 SCSI Disk Drive Housing

Before removing a SCSI HDD, please be careful to disconnect all the relevant wires/ cables and fans behind the IDE disk drive and the SCSI disk drive housing, as well as the SCSI mobile trays; this facilitates removal, and reduces risk to the hard drive and its data. When in doubt, please consult with an experienced technician.

The procedure for taking out the SCSI disk drive housing is as follows:

1. Open the top chassis cover and release the two thumb screws; to pull out the backplane holder until you can remove the SCSI disk drive housing easily.
2. Disconnect the two fan wires on the alarm board and the three power wires and the SCSI flat cable on the SCSI backplane.
3. Undo the four screws of the alarm board, and then move it away.
4. Loosen the four screws of the cushions and then carefully take out the SCSI disk drive housing.

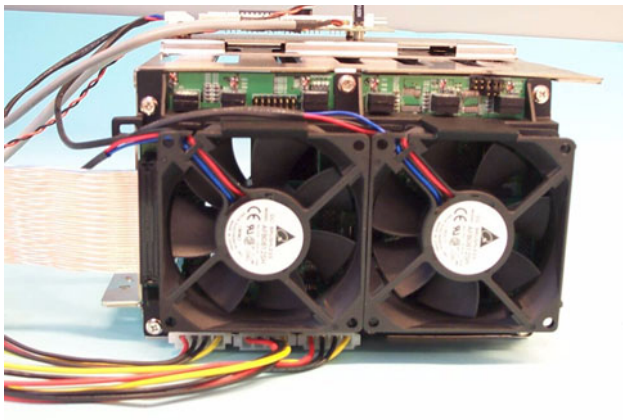


Figure 5.3 SCSI disk drive housing and wires

5.3 Wires & Cables of the SCSI Storage

There is one 68-pin SCSI flat cable in the accessory package. This cable is for connecting the add-on SCSI RAID card/controller and the SCSI backplane. The power wires of the dual fans should be connected to the alarm board. The three 4-pin power connectors on the rear side of the SCSI backplane are for connecting the power wires from the power supply.

Note! *Please be sure to plug these wires and cables in well before you install any SCSI HDD. When you have to take out the SCSI disk drive housing from the chassis, please disconnect the wires and cables first.*

5.4 Installing SCSI Disk Drives

5.4.1 Installing the SCSI Disk Drives

Note! *There are various types of 3.5" SCSI HDDs on the market. You should choose the SCSI SCA-2 80-pin 3.5" HDD. If you're not sure which type to choose, please contact a local sales representative.*

Please follow the installation procedures below.

1. Open the front door by turning the rotary lock.
2. Push up the latch on the mobile tray (See *Figure 5.4)*.
3. Press down the handle of the mobile tray and pull it out as far as it will go. Then completely take out the tray (Refer to *Figure 5.5)*.
4. Install a 3.5" x 1" high SCSI SCA 80-pin HDD to the tray using the six screws (See *Figure 5.6*).
5. Return the mobile tray with SCSI HDD to the disk drive housing and push it in by the handle until it is locked into the original position.
6. Push down the latch to lock the tray in place.

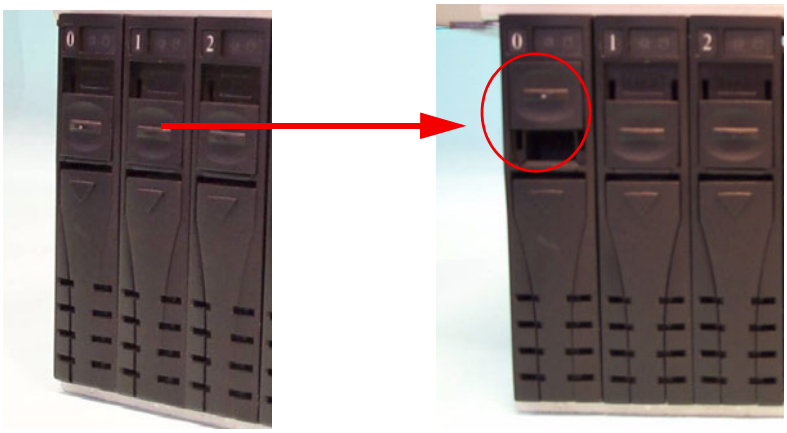


Figure 5.4 Pushing up the latch

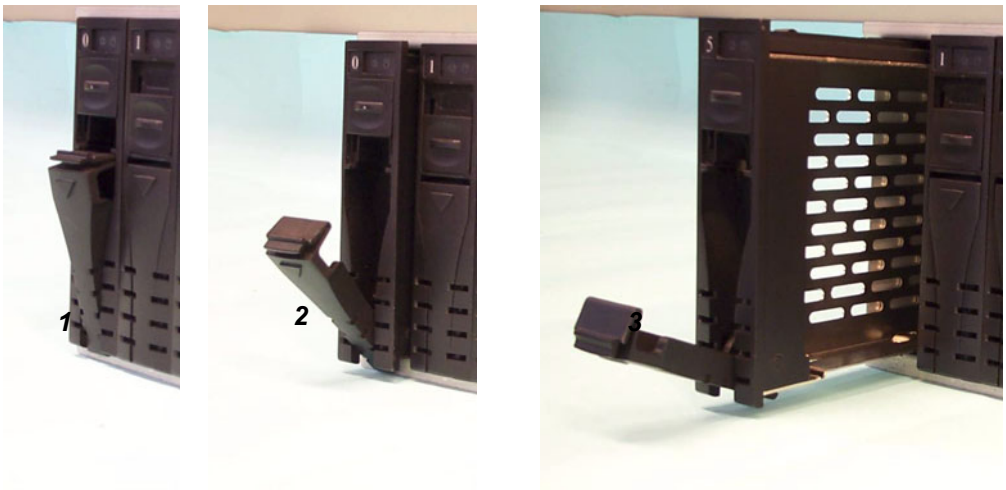


Figure 5.5 Removing the mobile tray

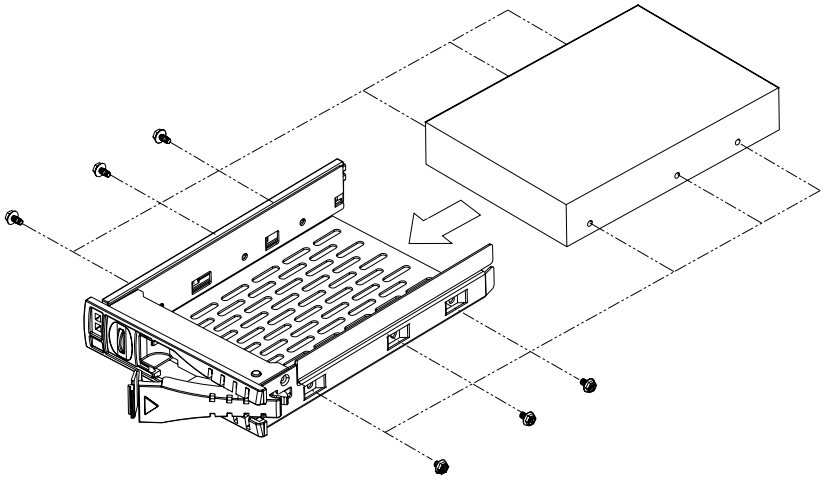
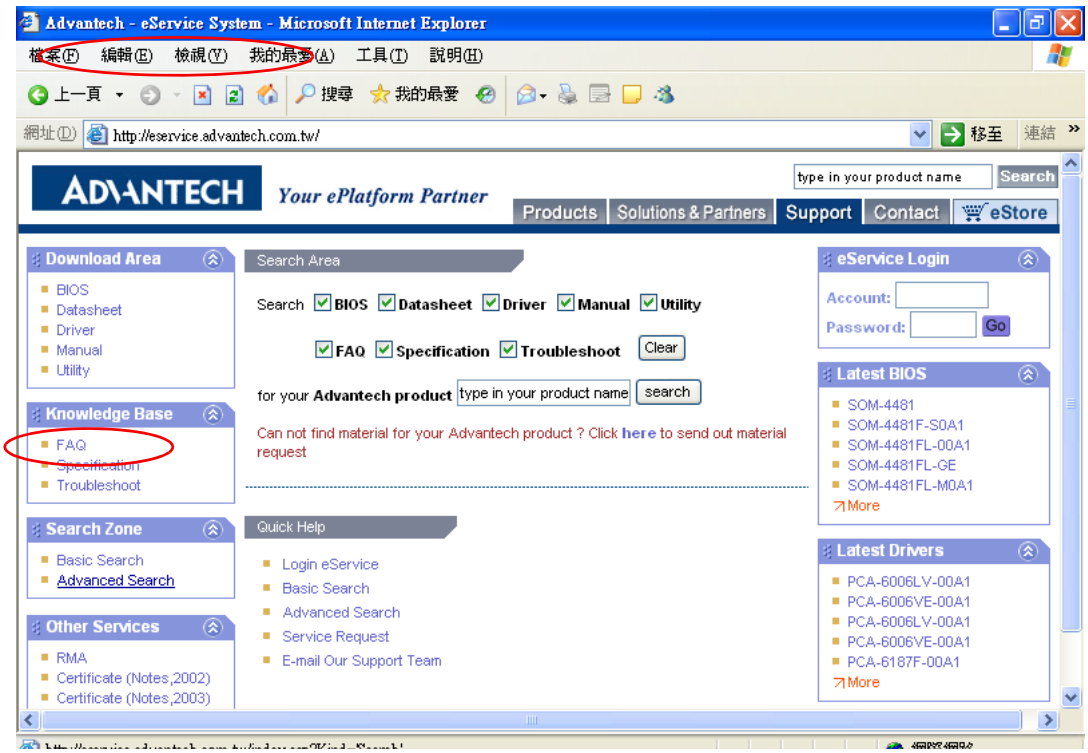


Figure 5.6 Installing a SCSI SCA-2 80-pin HDD

5.4.2 Installing GEM318 Driver

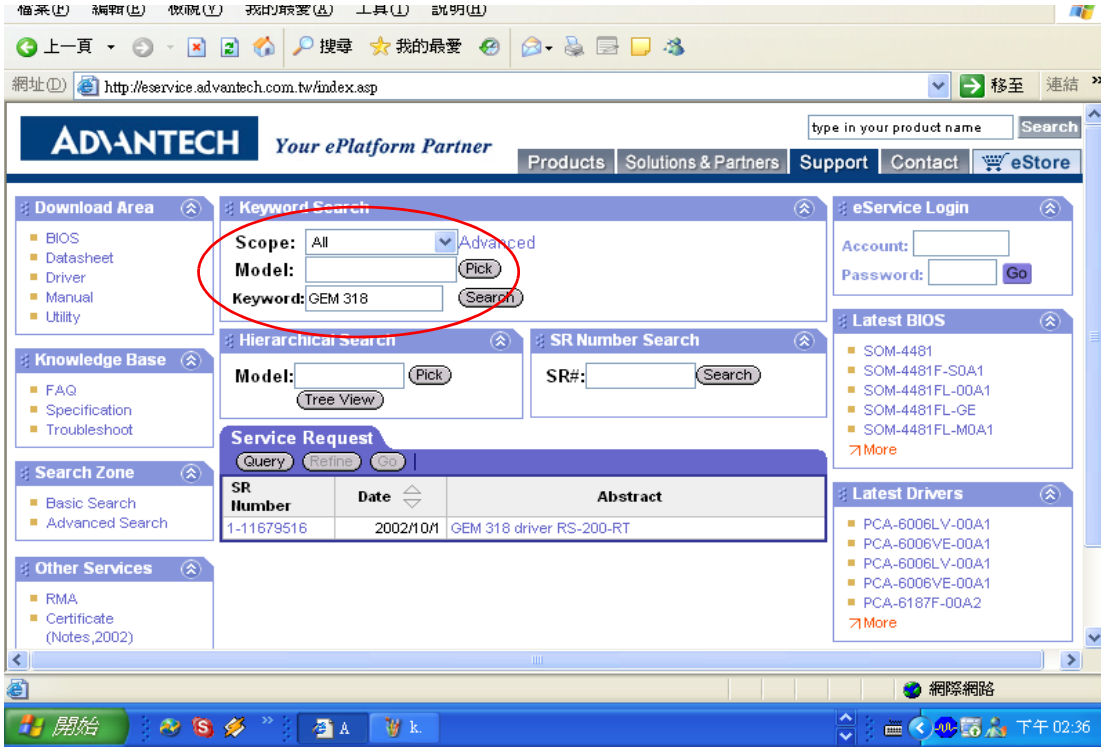
Users can usually install a SCSI HDD without a driver. But if you use Windows 2000 OS and would like it to recognize a GEM318 SCSI device, you can install the driver from Advantech's website. Please follow the steps below to download the GEM318 driver and install it to your system.

1. Advantech's eService website: http://eservice.advantech.com.tw



Click on the **Advanced Search**.

Type "***GEM 318***" under the **Keyword** field. Then click on Search



The specific driver will show on the **Service Request** section.

2. Click the driver and you will see 2 files. The file **GEM-install.doc** is the installation guide, and the file **gem318.inf** is the driver you need to install.
3. Please be sure to follow the installation steps given in **GEM-install.doc** in order to successfully complete the installation.

5.5 SAF-TE

SAF-TE stands for SCSI Accessed Fault-Tolerant Enclosure. The SCA backplane with built-in GEM318 chipset supports SAF-TE. It provides a standard, non-proprietary way for third party disk and RAID controllers to be fully integrated with peripheral packing that supports status signals (LED, audible alarm, LCD, etc.), hot-swappable Ultra320 SCSI HDDs, and monitoring of enclosure components, such as disk drives, power supplies, thermal sensors, fans, etc. For ACP-7000, the GEM318 chipset checks the disk status only; others, such as fans, temperature, power supply, and voltage, are monitored by an alarm board.

5.6 RAID Application

RAID stands for Redundant Array of Inexpensive/Independent Disks. The ACP-7000 can be integrated with a SCSI RAID card, such as AMI (LSI), Adaptec, Intel or Mylex RAID card to perform Disk Array functions. The SCSI RAID controller is another suitable option to integrate with the ACP-7000. Please note the length limitation of the SCSI RAID controller - the maximum length of your RAID controller must be less than **240 mm** (See *Figure 5.7*)

When you install an add-on SCSI RAID card or a SCSI RAID controller as a RAID system, please follow these steps:

1. Open the top chassis cover and find the 68-pin Ultra320 SCSI connector on the rear side of the SCSI backplane.
2. Connect the provided Ultra320 SCSI 68-pin flat cable from the SCSI backplane to the add-on SCSI RAID card or controller.
3. You can install up to six SCSI SCA-2 80-pin HDDs. Please follow the instructions of the SCSI RAID card or controller to implement your RAID system.

Table 5.2: SCSI HDD Power and Activity Status LEDs

LED	Description	Green	Blue	Red	Blue & Red
PWR	power of HDD	HDD power on	N/A	N/A	N/A
Status	Status of HDD	N/A	Data access	HDD failure	Data rebuild or construction

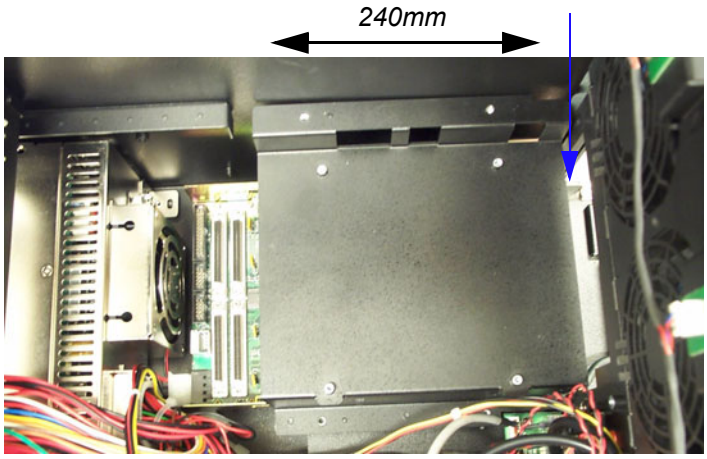


Figure 5.7 Length for RAID card or controller

Appendix A

Exploded Diagram and Parts List

A.1 Exploded Diagrams

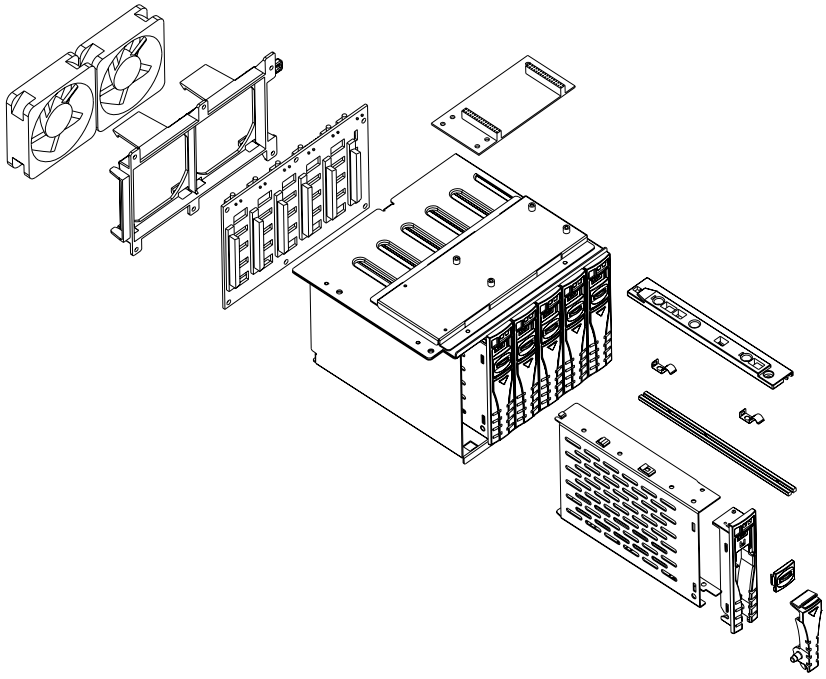


Figure A.1 Exploded Diagram 1

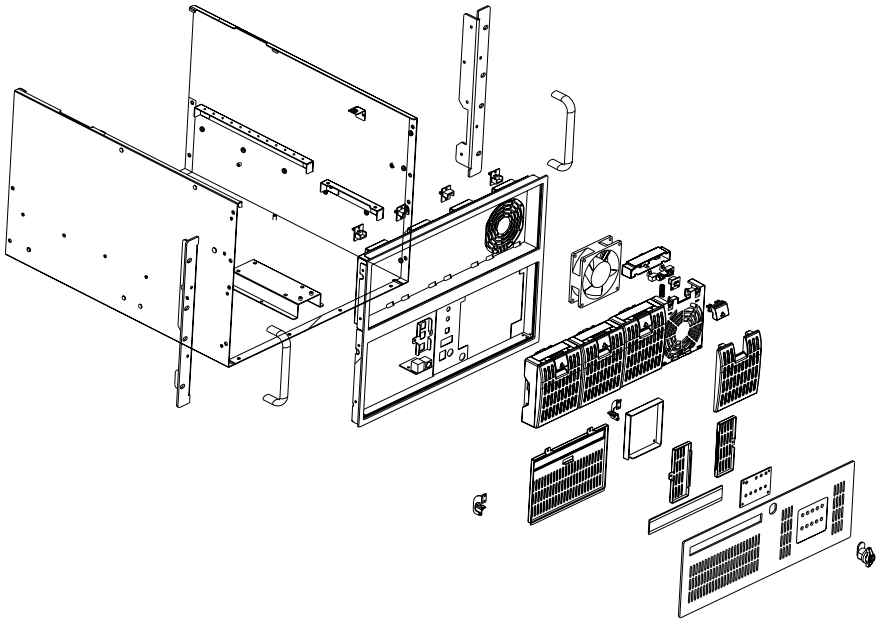


Figure A.2 Exploded Diagram 2

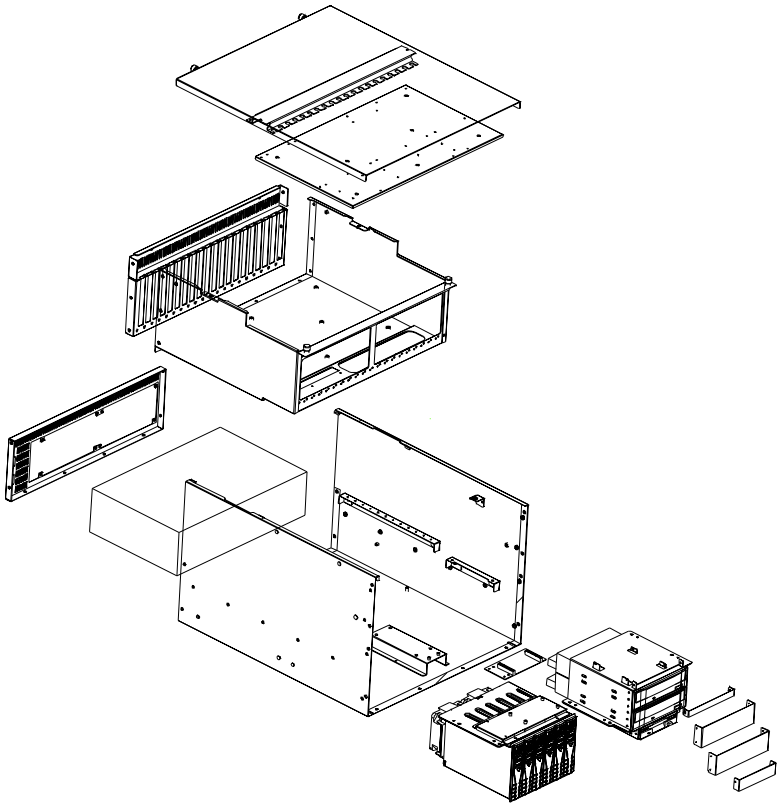


Figure A.3 Exploded Diagram 3

Appendix B

Backplane & Motherboard Options

B.1 Backplane Options

The ACP-7000 supports a variety of PICMG 1.3 / 1.0 backplanes. Users can contact a local sales representative for information and detailed specifications.

Table B.1: PICMG 1.3 Backplane Options

Model Name	Segment	Slots per Segment			
		SHB*	PCIe x 16	PCI-X	PCI
PCE-5B18	Single	1	1	8	8
PCE-5B16Q	Quad	4	4	-	8

*SHB: System Host Board

Table B.2: PICMG 1.0 Backplane Options

Model Name	Segment	Slots Per Segment			
		PICMG	PICMG/PCI	PCI	ISA
PCA-6120P4	Single	2	--	4	14
PCA-6120P12	Single	1	1	11	7
PCA-6120P18	Single	1	1	17	1
PCA-6119P7	Single	2	--	7	10
PCA-6119P16X	Single	2	--	16	1
PCA-6119P17	Single	1	1	16	--

B.2 Motherboard Options

The ACP-7000 supports a variety of Advantech ATX motherboards as listed below. You can contact a local sales representative for detailed information.

Table B.3: Motherboard Options

Model Name	Bus				
	PCI	PCI/ISA	ISA	AGP	SATA
AIMB-742	4 (32-bit)	1	1	1 (8X)	2
AIMB-744	2 (PCI-X 64-bit) 4 (PCI 32-bit)	--	--	1 (8X)	2
AIMB-750	2 (PCI-X 64-bit) 4 (PCI 32-bit)	--	--	1 (4X)	2
AIMB-760	1 (PCIe 16X) 2 (PCIe 1X) 5 (PCI 32-bit)	--	--	--	4
AIMB-762	1 (PCIe 16X) 1(PCIe 4X) 5 (PCI 32-bits)	--	--	--	4
AIMB-763	1 (PCIe 16X) 1(PCIe 1X) 5 (PCI 32-bits)	--	--	--	4
AIMB-764	1 (PCIe 16X) 1(PCIe 4X) 5 (PCI 32-bits)	--	--	--	5
AIMB-766	1 (PCIe 16X) 2 (PCIe 1X) 4 (PCI 32-bits)	--	--	--	6

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